

Sudan Thin DxP
Logging Feasibility Report

West Alsea Land Management Project EA

Central Coast Ranger District

Siuslaw National Forest

Prepared By: Mitchell LaChapelle October, 11 2015

Table of Contents

Summary 3

Resource Management Objectives..... 4

Timber Characteristics 4

Recommended Logging Systems..... 4

Logging Plan Narrative..... 5

Skyline Profile Data and Payload Analyses (see Appendix A) 7

Equipment Access and Haul Route..... 7

Appendix A: Logger PC and Profile Data

Appendix B: Appraiser Information

Appendix C: Logging Plan Overlays for Aerial Photos

Summary

Sudan Thin DXP is comprised of 7 thinning units. Current trees per acre range between 200 and 240 (TPA); based on stand-exam data. After thinning the units will have areas consisting 60, 70, 80 and 85 TPA. Stand exam information was used for estimated volumes. The total sale acreage is estimated at 286; total volume is estimated at 5,734MBF or 10,689 CCF. The project area is located in T. 14 S., R. 11 W. Sections 2, 3, 4.

Douglas-fir is the dominant species in units 3, 4, 5, 6. Western hemlock is the dominant species in unit 1, 2, 7. As much as is feasible, hardwoods will not be felled in the units. No Pacific yew were observed during stand exams and logging systems analyses; if any Pacific yew is found during operations, none will be felled. Minimum DBH for trees to be harvested is 7 inches. Trees less than 7 inches will be protected where practical.

GIS was used to calculate the length for most roads and the acres for the units. A string box was used to determine the length for temporary roads (see Table 1.).

System road 5390 will generally require roadside brushing, grading, and additional rock.

Table 1. Estimated quantities for landings, tailtrees, intermediate supports and deadman anchors

*G = guyline anchor; T = tailhold anchor (cat tractor on existing landing is recommended)

Unit	Temporary Road Reopening (Feet)	New Temporary Road Building (Feet)	Number of Landings	Number of Tailtrees	Number of Intermediate Supports	Number of Special Anchors (G/T)*
1	1802	0	3	18	1	0
2	8490	0	22	58	6	Eq. 2, G
3	1436	0	4	20	1	0
4	1413	0	4	7	3	0
5	650	0	4	34	0	0
6	1807	0	16	48	4	0
7	2490	0	4	10	1	Eq. 2, G
Total	15,598	0	57	197	16	Eq. 4, G

Resource Management Objectives

The stand prescriptions, unit layout, and logging and transportation plans will be designed to meet the following resource objectives:

- Speed the development of late-successional forest characteristics in managed stands by thinning these heavily stocked stands to maintain stand health, promote tree growth, and enhance stand diversity.
- Manage riparian reserves consistent with the Northwest Forest Plan's Aquatic Conservation Strategy.
- Protect water quality and fish habitat in all streams.
- Minimize soil disturbance during all phases of harvest activity.
- Protect T&E wildlife species by limiting operating seasons.

Timber Characteristics

Refer to the cruise data for information about timber characteristics.

Recommended Logging Systems

A. Logging System Requirements

The following requirements are designed to meet the resource management objectives stated in section I.

- Except during lateral yarding, the skyline must be capable of keeping the leading end of logs suspended above the ground during inhaul.
- Where yarding occurs across streams, the skyline system must be capable of keeping the entire length of logs fully suspended above streams during inhaul.
- Where the skyline passes through stream buffers, skyline corridors will be spaced so that no more than 20% of the existing canopy in the buffers will be removed in a given 1,000 foot reach of stream.
- Minimum skyline corridor spacing shall be 120 feet and maximum corridor width shall not exceed twelve (12) feet.
- Ground-based yarding shall be limited to slopes of 30 percent or less and use designated skid trails. All designated skid trails must be approved by the sale administrator.

B. Acceptable Yarding Equipment

The skyline system should be capable of transporting logs for a horizontal distance of up to 1,600 feet. A rigging length of up to 2,100 feet might be necessary to reach tailholds.

The skyline system must: (1), be capable of meeting the log suspension requirements stated above; (2), be capable of lateral yarding; and (3), be capable of being rigged in a multi-span configuration (Units 1, 2, 3, 4, 6, 7).

The carriage must be capable of maintaining a fixed position on the skyline, while lateral yarding up to 120 feet on either side of the skyline in some instances, and it must be capable of passing support jacks where intermediate supports are used.

Ground-based equipment must be able to provide suspension of the leading end of logs during skidding (units 1, 2, 3, 4, 6, 7).

C. Logging System Specifications

Table 3 & 4 shows the specifications of the logging systems that were used in the analysis for this project. These systems are recommended because they are available, capable of meeting the resource management objectives and logging system requirements, reduce the number of intermediate supports needed, and are capable of doing the job economically.

Table 3. Recommended logging system specifications

Yarder	Thunderbird 6150, SPCM
Tower height	50 feet
Skyline diameter/length/type	0.875 inches/2,000 feet/Swaged
Mainline diameter/length/type	0.625 inches/2,300 feet/Swaged
Haulback diameter/length/type	0.5 inches/4,300 feet/Swaged
Strawline diameter/length/type	N/A
Carriage	Eagle Eaglet motorized; 1,300 pounds

Other equipment—Hardware for rigging tailtrees (2 sets) and intermediate supports (3 sets) crawler tractor for landing clearing; equipment for a guyline and tailhold anchors; a Yoader or Modified Loader; ground-based equipment for yarding logs on designated slopes of 30 percent or less; and a loader/shovel.

Logging Plan Narrative

This section discusses the logging and transportation plans for each unit (See Unit Summary Sheets).

A. General Information

- All unit boundaries are marked with blue-paper or aluminum tags and yellow ribbon and orange tracer paint.
- All landings are marked with yellow plastic tags, and solid blue and solid white ribbon.

- Minor clearing is required for some landings.
- Landings are located to minimize yarding over buffered streams and headwalls.
- All roads and landings will be reviewed on the ground by a District hydrologist and the Forest transportation planner for the timber-sale appraisal and contract.
- Log hauling will be limited to the **dry season on most temporary roads** because of the cost associated with the quantity of rock needed.
- There are a few streams and associated headwalls that exist within the units. These areas will be buffered and excluded from the units. Buffer boundaries will be marked on the ground to protect slope stability and water quality. Full-log suspension is required over streams and headwalls.
- Skyline landings generally use fan-shape and parallel settings, with most turnroads using single-span configurations. Tailholding on opposing slopes is emphasized, where opportunities exist, to reduce the need for tailtrees and intermediate supports.
- Where yarding will occur over streams, some areas may lack the deflection necessary to obtain full suspension of logs during whole-tree yarding; therefore, shorter log lengths will be required over these areas.
- Most of the units will require some loader/shovel logging along the roadway or on designated skid trails.

Note: Portion of unit 6 is planned for some tractor or shovel swing logging system. A skyline/yoder logging system is planned for volume to Unit 6, Landing "C" and either using a shovel swing or tractor swing system to Unit 6 Landing "D" located on FS road 5390.

Skyline Profile Data and Payload Analyses (see Appendix A)

Profile and skyline payload analyses were conducted with SkylineXL_14. Adequate tree sizes are available for tailtrees and intermediate supports, using a rigging height of up to 40 feet (most profile analyses figured tailtrees and intermediate supports at a height of 20 and 30 feet), and a skyline diameters of 0.75 or 0.875 inches. Adequate payloads equate to three average logs or two long logs (whole-tree length, measured from the stump cut to a 5" top).

Equipment Access and Haul Route

The sale location and probable equipment access and haul routes are displayed on the vicinity map in the timber sale contract. No access or haul route problems are anticipated. The forest transportation planner has verified the following haul routes.

Log haul for all the units in this timber sale are planned to haul southwest on paved Forest Service Rd 5300 to HWY 34, and east to Philomath.

Appendix A

SkylineXL and Profile Data

Appendix B

Appraiser Information

Watershed—Southworth Creek and Sudan Creek Watersheds

Environmental Assessment- West Alsea Landscape Management Project EA (April 2008) covers the sale area.

Survey monuments—see unit summary sheets and logging map.

Appendix C

Logging Plan Overlays for Aerial Photos

Sudan Thin DxP Unit Summary Sheet

Central Coast Ranger District

General Information

Unit # : 1 **Stand # :** 504222
Legal Location: T. 14 S. R. 11 W; Sec. 3,4 **Acres:** 15
Photo Number: 1962-EIJ 11-167 **Year of Origin:** 1961
Unit Designation: DxP **Residual TPA Post Harvest:** CT-80 TPA
Recon by/Date: M. LaChapelle October 2015

Volume Information

Source of volume estimate: Stand Exam **Estimated Volume:** 14 MBF/acre

Special Considerations

	Yes	No		Yes	No
Power Lines		x	Fences		x
Invasive/Sensitive Plants	x		Heritage Sites		x
Dump Sites		x	Meadows		x
Survey Monuments		x	Water Systems		x
Improvements		x	Other		x

Road and Landing Information

Landing	Road Type	Road Length	Road Status		Landing	Road Type	Road Length	Road Status
A	non-system	310	Existing					
B	non-system	270	Existing					
C	non-system	1230	Existing					

Notes

Invasives:Scotch broom located during recon

 Sale: Area to the south of LND C along blowdown area shall have a 100-150 foot buffer to reduce risk of blowdown to the rest of the stand.
 BPA road right-of-way; see BPA documents for logging requirements.

Note to Pre-
 Temp Utilizes

Sudan Thin DxP Unit Summary Sheet

Central Coast Ranger District

General Information

Unit # : 2 **Stand # :** 504213
Legal Location: T.14S., R11W. Sec. 3 **Acres:** 88
Photo Number: 1968 ETJ-2-245 **Year of Origin:** 1963
Unit Designation: DxP **Residual TPA Post Harvest:** CT-75 TPA
Recon by/Date: M. LaChapelle October 2015

Volume Information

Source of volume estimate: Stand Exam **Estimated Volume:** 14.5

Special Considerations

	Yes	No		Yes	No
Power Lines		x	Fences		x
Invasive/Sensitive Plants	x		Heritage Sites		x
Dump Sites		x	Meadows		x
Survey Monuments	x		Water Systems		x
Improvements		x	Other		x

Road and Landing Information

Landing	Road Type	Road Length	Road Status		Landing	Road Type	Road Length	Road Status
					K	Non-system	630	Existing
					L	non-system	665	Existing
					M	Non-system	462	Existing
					N	Non-system	150	Existing
E	non-system	550	Existing		O	Non-system	170	Existing
F	non-system	410	Existing		P	5390		Existing
G	non-system	460	Existing		Q	5390		Existing
H	non-system	130	Existing		R	5390		Existing
I	non-system	560	Existing		S	5390		Existing
J	non-system	100	Existing		T	Non-system	200	Existing

Notes

Invasives: Scotch broom and H. blackberry
 Note: LND "M" of Unit 5 is located on Temp Spur #5 for Unit 2
 Northern portion of unit 2 the FS/PVT boundary is well marked with orange carsonites and blazed trees. The
 FS/PVT boundary between the 5300 and 5390 is well established
 Monumnet located just north of landing E

The
Survey

Sudan Thin DxP Unit Summary Sheet

Central Coast Ranger District

General Information

Unit # : 3 **Stand # :** 504198
Legal Location: T. 14 S., R 11 W. Sec. 3 **Acres:** 25
Photo Number: 1189 179-174 **Year of Origin:** 1975
Unit Designation: DxP **Residual TPA Post Harvest:** CT-70 TPA
Recon by/Date: M. LaChapelle October 2015

Volume Information

Source of volume estimate: Stand Exam **Estimated Volume:** 13. MBF/acre

Special Considerations

	Yes	No		Yes	No
Power Lines		x	Fences		x
Invasive/Sensitive Plants	x		Heritage Sites		x
Dump Sites		x	Meadows		x
Survey Monuments		x	Water Systems		x
Improvements		x	Other		x

Road and Landing Information

Landing	Road Type	Road Length	Road Status		Landing	Road Type	Road Length	Road Status
A	non-system	275	Existing					
B	non-system	760	Existing					
C	non-system	270	Existing					

Notes

Invasives: Scotch broom & English holly **
 The FS/PVT boundary to the north is well established

[illegible]

Sudan Thin DxP Unit Summary Sheet

Central Coast Ranger District

General Information

Unit # : 4 **Stand # :** 504407
Legal Location: T. 14S. R. 11 W. Sec. 3 **Acres:** 4
Photo Number: 1189-173, 0672-54 **Year of Origin:** 1971
Unit Designation: DxP **Residual TPA Post Harvest:** CT-80 TPA
Recon by/Date: M. LaChapelle October 2015

Volume Information

Source of volume estimate: Stand Exam **Estimated Volume:** 12.69

Special Considerations

	Yes	No		Yes	No
Power Lines		x	Fences		x
Invasive/Sensitive Plants		x	Heritage Sites		x
Dump Sites		x	Meadows		x
Survey Monuments		x	Water Systems		x
Improvements		x	Other		x

Road and Landing Information

Landing	Road Type	Road Length	Road Status		Landing	Road Type	Road Length	Road Status
B	Non-system	270	Existing					
C	Non-system	180	Existing					
D	Non-system	800	Existing					

Notes

The FS/PVT boundary to the north is well established

[illegible]

Key: Logging System abbreviations are Skyline (S), Ground-Based (GB), Yoader (Y), Helicopter (H), or a combination of logging systems for each landing. Guyline anchor trees abbreviations are P for plantation, M for mature, and B for both. Special anchor abbreviations are Equipment (Eq), Deadmen (D), Earth (E), guyline (G) anchor, and tailhold (T). Abbreviations for intermediate supports (IS) and tailtree (TT).

Unit Totals and Averages

Average Yarding Distance:	<u>250</u>	Average Net Pound per Payload:	<u>3200</u>
Average Mainline Tension:	<u>3500</u>	Average Slope:	<u>45</u>
Maximum Tagline Needed:	<u>none</u>	Total Number of Corridors:	<u>7</u>
Maximum Yarding Distance:	<u>1000</u>	Total Number of Landings:	<u>3</u>

Notes

All profiles were analyzed using GIS and LIDAR data
A haulback line may be required for yarding from LND's B & D

Sudan Thin DxP Unit Summary Sheet

Central Coast Ranger District

General Information

Unit # :	<u>5</u>	Stand # :	<u>504408</u>
Legal Location:	<u>T. 14 S. R. 11 W. Sec. 3</u>		Acres: <u>45</u>
Photo Number:	<u>0672-53</u>	Year of Origin:	<u>1971</u>
Unit Designation:	<u>DxD</u>	Residual TPA Post Harvest:	<u>CT-80 TPA</u>
Recon by/Date:	<u>M. LaChapelle October 2015</u>		

Volume Information

Source of volume estimate:	<u>Stand Exam</u>	Estimated Volume:	<u>13 MBF/Acre</u>
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Special Considerations

	Yes	No		Yes	No
Power Lines	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Fences	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Invasive/Sensitive Plants	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Heritage Sites	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Dump Sites	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Meadows	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Survey Monuments	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Water Systems	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Improvements	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Other	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Road and Landing Information

Landing	Road Type	Road Length	Road Status		Landing	Road Type	Road Length	Road Status
A	5300		Existing					
B	non-system	270	Existing					
C	non-system	380	Existing					
D	5390-414		Existing					
M								

Notes

Note: Road length for LND "M" is calculated with Temp Spur #5 Unit 2

Sudan Thin DxP

Central Coast Ranger District

General Information

Unit # :	<u>6</u>	Stand # :	<u>504229 & 504227</u>
Legal Location:	<u>T.14 S. R11W. Sec. 3</u>	Acres:	<u>95</u>
Photo Number:	<u>179-41</u>	Year of Origin:	<u>1979</u>
Unit Designation:	<u>DxP</u>	Residual TPA Post Harvest:	<u>CT-60 TPA</u>
Recon by/Date:	<u>M. LaChapelle October 2015</u>		

Volume Information

Source of volume estimate:	<u>Stand Exam</u>	Estimated Volume:	<u>12.5 MBF/acre</u>
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Special Considerations

	Yes	No		Yes	No
Power Lines		x	Fences		x
Invasive/Sensitive Plants	x		Heritage Sites		x
Dump Sites		x	Meadows		x
Survey Monuments		x	Water Systems		x
Improvements		x	Other		x

Road and Landing Information

Landing	Road Type	Road Length	Road Status		Landing	Road Type	Road Length	Road Status
A	5300		Existing		K	non-system	172	Existing
B	5300		Existing		L	5390		Existing
C	non-system		Existing		M	non-system	90	Existing
D	5390		Existing		N	non-system	430	Existing
E	5390		Existing		O	non-system	300	Existing
F	5390		Existing		P	5390		Existing
G	non-system	214	Existing					
H	5390		Existing					
I	non-system	200	Existing					
J	non-system	400	Existing					

Notes

Invasives: English holly and H. blackberry located on temp spur

**

FS/BLM

Boundary to the south is poorly marked, was able to find brass caps on both east and west corners

Logging Systems Information							Unit #	6
Landing	Logging System Type	Guyline Anchor Trees	Multiple Guy Anchors	Special Anchors	Intermediate Supports	Tailtrees	Logging Profiles Run and Azimuth/Length	
A	S	P	no	none	3 IS, 30	7 TT; 20,30,40	Yes	
B	S	P	No	none	none	2 TT; 10,30	No	
C	Y/GB	P	No	none	none	3 TT; 20,30	No	
D	GB					none		
E	Y	P	No	none	none	2 TT; 20	No	
F	Y	P	No	none	none	1 TT; 20	No	
G	Y	P	No	none	none	1 TT; 40	Yes	
H	Y	P	No	none	none	3 TT; 10,20,30	No	
I	Y	P	No	none	none	3 TT; 10,20,30	No	
J	S	P	No	none	none	7 TT; 10,15,20	No	
K	Y	P	No	none	none	3 TT; 20,30	No	
L	Y	P	No	none	none	5 TT; 20	No	
M	Y	none	No	none	none	none	No	
N	S	P	No	none	1 IS, 20	5 TT; 5,10,20	No	
O	S	P	No	none	none	6 TT; 10,15,20	No	
P	GB							

Key: Logging System abbreviations are Skyline (S), Ground-Based (GB), Yoader (Y), Helicopter (H), or a combination of logging systems for each landing. Guyline anchor trees abbreviations are P for plantation, M for mature, and B for both. Special anchor abbreviations are Equipment (Eq), Deadmen (D), Earth (E), guyline (G) anchor, and tailhold (T). Abbreviations for intermediate supports (IS) and tailtree (TT).

Unit Totals and Averages			
Average Yarding Distance:	<u>500</u>	Average Net Pound per Payload:	<u>2200</u>
Average Mainline Tension:	<u>3000</u>	Average Slope:	<u>45</u>
Maximum Tagline Needed:	<u>none</u>	Total Number of Corridors:	<u>64</u>
Maximum Yarding Distance:	<u>1400</u>	Total Number of Landings:	<u>16</u>

Notes

All Profiles were analyzed with GIS and LIDAR data **
 LNDs A,B,F,L, and M may require the use of a haulback **
 Ground Based Yarding Summary:GB Acres: 10 Ave Skidding Distance: 300'
 Tractor/shovel log using existing skid trails when/where possible: Favorable and adverse skidding required ranging from 10-35% slope. Some endlining may be required up to 75-100' between skidtrails to reach directionally felled timber or areas of slopes greater than 30%.

Sudan Thin DxP Unit Summary Sheet

Central Coast Ranger District

General Information

Unit # : 7 **Stand # :** 504213
Legal Location: T.14S., R11W. Sec. 3 **Acres:** 14
Photo Number: 1968 ETJ-2-245 **Year of Origin:** 1963
Unit Designation: DxP **Residual TPA Post Harvest:** CT-80 TPA
Recon by/Date: M. LaChapelle October 2015

Volume Information

Source of volume estimate: Stand Exam **Estimated Volume:** 14.5

Special Considerations

	Yes	No		Yes	No
Power Lines		x	Fences		x
Invasive/Sensitive Plants	x		Heritage Sites		x
Dump Sites		x	Meadows		x
Survey Monuments	x		Water Systems		x
Improvements		x	Other		x

Road and Landing Information

Landing	Road Type	Road Length	Road Status		Landing	Road Type	Road Length	Road Status
A	non-system	970	Existing					
B	non-system	180	Existing					
C	non-system	320	Existing					
D	non-system	1020	Existing					

Notes

Invasives: Scotch broom and H. blackberry on Temp Spur #1 accessing LND A
 Note: The Northern portion of unit 7 the FS/PVT boundary is well marked with orange carsonites and blazed trees. The FS/PVT boundary between the 5300 and 5390 is well established
 Survey Monumnet located just north of landing E

[illegible]